

Optimization of a laser remote sensing magnetometer

Completed Technology Project (2015 - 2017)



Project Introduction

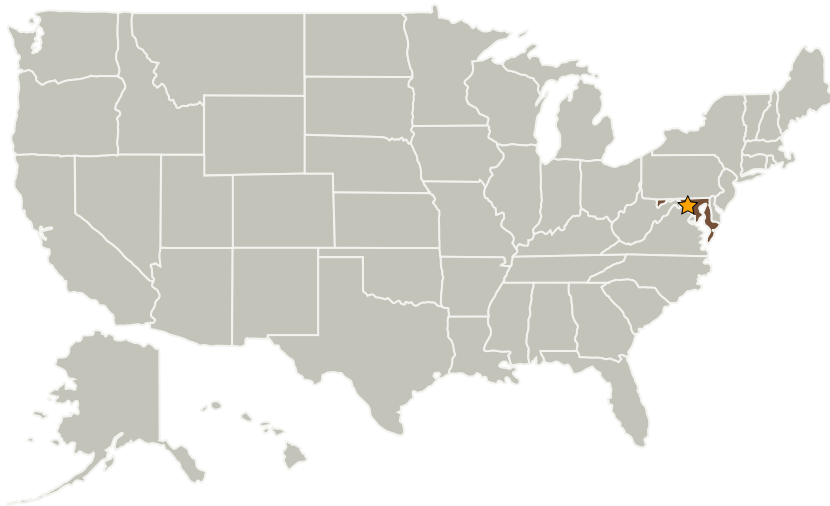
The project would conduct optimization experiments on the bench-top magnetometer, build and integrate the results of the now completed Office of Naval Research (ONR) study with our work, and further explore mission concepts and link budgets.

There are several tasks involved in this project: optimization of excitation wavelength distribution, the laser spectral energy distribution, the laser polarization, and the optimum optical receiver configuration, in order to recover scalar and some vector magnetic fields of importance to both planetary and terrestrial solid body, and magnetospheric/heliospheric science.

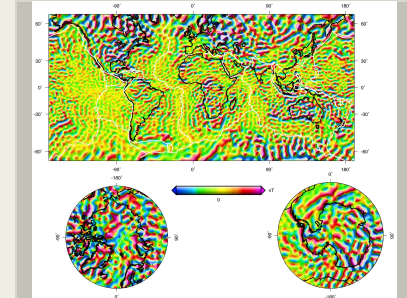
Anticipated Benefits

For remote sensing of magnetic fields at Mars via an orbital mission to the red planet and other planetary targets.

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
★ Goddard Space Flight Center (GSFC)	Lead Organization	NASA Center	Greenbelt, Maryland



Magnetic Field of the Earth

Table of Contents

Project Introduction	1
Anticipated Benefits	1
Primary U.S. Work Locations and Key Partners	1
Project Transitions	2
Images	2
Organizational Responsibility	2
Project Management	2
Technology Maturity (TRL)	2
Technology Areas	3
Target Destinations	3

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Primary U.S. Work Locations

Maryland

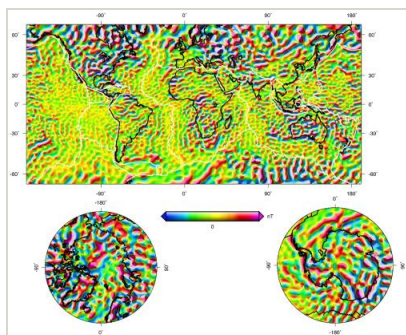
Project Transitions

October 2015: Project Start

September 2017: Closed out

Closeout Summary: The purpose of the Goddard Space Flight Center's Internal Research and Development (IRAD) program is to support new technology development and to address scientific challenges. Each year, Principal Investigators (PIs) submit IRAD proposals and compete for funding for their development projects. Goddard's IRAD program supports eight Lines of Business: Astrophysics; Communications and Navigation; Cross-Cutting Technology and Capabilities; Earth Science; Heliophysics; Planetary Science; Science Small Satellites Technology; and Suborbital Platforms and Range Services. Task progress is evaluated twice a year at the Mid-term IRAD review and the end of the year. When the funding period has ended, the PIs compete again for IRAD funding or seek new sources of development and research funding or agree to external partnerships and collaborations. In some cases, when the development work has reached the appropriate Technology Readiness Level (TRL) level, the product is integrated into an actual NASA mission or used to support other government agencies. The technology may also be licensed out to the industry. The completion of a project does not necessarily indicate that the development work has stopped. The work could potentially continue in the future as a follow-on IRAD; or used in collaboration or partnership with Academia, Industry and other Government Agencies. If you are interested in partnering with NASA, see the TechPort Partnerships documentation available on the TechPort Help tab. <http://techport.nasa.gov/help>

Images

**Magnetic Field of the Earth**

Magnetic Field of the Earth

(<https://techport.nasa.gov/image/19276>)

Organizational Responsibility

Responsible Mission Directorate:

Mission Support Directorate (MSD)

Lead Center / Facility:

Goddard Space Flight Center (GSFC)

Responsible Program:

Center Independent Research & Development: GSFC IRAD

Project Management

Program Manager:

Peter M Hughes

Project Managers:

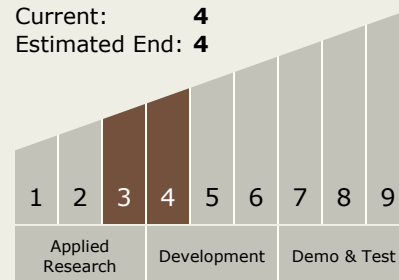
Brook Lakew

Michael J Amato

Principal Investigator:

Michael E Purucker

Technology Maturity (TRL)

Start: **3**Current: **4**Estimated End: **4**

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Technology Areas

Primary:

- TX14 Thermal Management Systems
 - └ TX14.3 Thermal Protection Components and Systems
 - └ TX14.3.2 Thermal Protection Systems

Target Destinations

Earth, Mars, Outside the Solar System